

REMARKS

[0002] Applicant respectfully requests reconsideration and allowance of all of the claims of the application. The status of the claims is as follows:

- Claims 1, 4-6, 9, 13 and 16-25 are currently pending
- Claim 14 is canceled herein
- Claims 1, 4, 9, 13 and 16-18 are amended herein
- New claims 19-25 are added herein

[0003] Support for the amendments to claims 1, 4, 9, 13 and 16-18 is found in the specification at least at Paragraphs [0043], [0044], [0053], [0054], [0083] – [0088] and FIG. 6.

[0004] Furthermore, new claims 19-25 are fully supported by the Application, and therefore do not constitute new matter. Support for these new claims is found in the specification at least at Paragraphs [0043], [0044], [0054], [0083] – [0088] and FIG. 6.

[0005] New claims 19-25 are allowable over the cited document of record for at least the same reasons that their base claims are allowable.

Claim 18 Comply With § 112 1st Paragraph

[0006] Claim 18 stands rejected under 35 U.S.C. § 112, ¶ 1, as allegedly failing to comply with the written description requirement. Applicant respectfully traverses this rejection.

[0007] Nevertheless, for the sole purpose of expediting prosecution and without commenting on the propriety of the Office's rejections, Applicant herein amends claim

18 as shown above. Specifically, the feature “generating pseudo-random weight factors, a and b” is removed from claim 18 herein without prejudice to or disclaimer of the subject matter recited therein. Applicant respectfully submits that this amendment render the § 112, ¶ 1 rejection moot.

Claim 18 Comply With § 112 2nd Paragraph

[0008] Claim 18 stands rejected under 35 U.S.C. § 112, ¶ 2, as allegedly being indefinite. Applicant respectfully traverses this rejection.

[0009] Nevertheless, for the sole purpose of expediting prosecution and without acquiescing in the propriety of the Office's rejections, Applicant herein amends claim 18 as shown above. Specifically, the recited feature – “stay approximately invariant under any local magnitude scaling of the digital good” – is removed from claim 18 herein without prejudice to or disclaimer of the subject matter recited therein. Applicant respectfully submits that these amendments render the § 112, ¶ 2 rejections moot.

Cited Document

[0010] The following document has been applied to reject one or more claims of the Application:

- **Venkatesan:** *Venkatesan et al.*, U.S. Patent Application Publication No. **2004/0001605**

Claims 1, 4-6, 9, 13, 14 and 16-18 Are Non-Obvious Over Venkatesan

[0011] Claims 1, 4-6, 9, 13, 14 and 16-18 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Venkatesan. Applicant respectfully traverses the rejection.

Independent Claim 1

[0012] Applicant submits that amended independent claim 1 is not obvious in view of Venkatesan. Applicant submits that Venkatesan does not teach or suggest at least the following features of this claim, as amended (with emphasis added):

- obtaining a digital good;
- partitioning the digital good into a plurality of regions;
- calculating rational statistics of one or more ~~[[the]]~~ regions of the plurality of regions, wherein:
 - ◊ the rational statistics of the one or more regions are representative of respective one or more regions,
 - the rational statistics of the one or more regions are generated via a hashing function having a quotient of two weighted, linear, statistical combinations,
 - **weights associated with the rational statistics of the one or more regions are pseudo-randomly generated based at least upon different secret keys, one different secret key for each region of the one or more regions,**
 - the rational statistics are semi-global characteristics;
- quantizing the rational statistics;
- marking the digital good with the quantized rational statistics of the one or more regions of the plurality of the regions.

[0013] Amended claim 1 currently recites in part that, “weights associated with the rational statistics of the one or more regions are pseudo-randomly generated based at

least upon different secret keys, one different secret key for each region of the one or more regions." Nowhere in Venkatesan is there any teaching or suggestion of this feature. Specifically, Paragraph [0092] of Venkatesan describes that "[a] **secret key K is the seed** for pseudo-random number generation here. **This same K may be used to reconstruct the regions** by an exemplary semi-global statistics quantization watermark detecting system 500." In view of this, Venkatesan does not teach or at least is silent as to the claim recitation of "weights associated with the rational statistics of the one or more regions are pseudo-randomly generated based at least upon different secret keys, **one different secret key for each region of the one or more regions.**"

[0014] Consequently, Venkatesan does not teach or suggest all of the elements and features of this claim. Accordingly, Applicant respectfully requests that the rejection of this claim be withdrawn.

Dependent Claims 4-6

[0015] Claims 4-6 ultimately depend from independent claim 1. As discussed above, claim 1 is allowable over the cited documents. Therefore, claims 4-6 are also allowable over the cited document of record for at least their dependency from an allowable base claim. These claims may also be allowable for the additional features that each recites.

Independent Claim 9

[0016] Applicant submits that amended independent claim 9 is not obvious in view of Venkatesan. Applicant submits that Venkatesan does not teach or suggest at least the following features of this claim, as amended (with emphasis added):

- obtaining a digital good; and
- using quantization, marking the digital good with a watermark, wherein:

- the quantization is based upon semi-global characteristics of regions of the digital good,
- the semi-global characteristics are generated via a hashing function employing a quotient of at least two weighted linear combinations of statistics of the regions of the digital good,
- wherein **a change in a hash vector space of the hashing function is mapped to a data space of the digital good and a dimensionality reduction from the data space of the digital space to the hash vector space of the hashing function occurs.**

[0017] Amended claim 9 currently recites in part that, “a change in a hash vector space of the hashing function is mapped to a data space of the digital good” and “a dimensionality reduction from the data space of the digital space to the hash vector space of the hashing function occurs.” Nowhere in Venkatesan is there any teaching or suggestion of these features. Specifically, although Venkatesan mentions “[r]obust image hashing” at Paragraph [0099] of Venkatesan, Venkatesan however is silent as to the teachings of “a change in a hash vector space of the hashing function is mapped to a data space of the digital good” and “a dimensionality reduction from the data space of the digital space to the hash vector space of the hashing function occurs” as currently recited in this claim.

[0018] Consequently, Venkatesan does not teach or suggest all of the elements and features of this claim. Accordingly, Applicant respectfully requests that the rejection of this claim be withdrawn.

Independent Claim 13

[0019] Applicant submits that amended independent claim 13 is not obvious in view of Venkatesan. Applicant submits that Venkatesan does not teach or suggest at least the following features of this claim, as amended (with emphasis added):

- a partitioner configured to segment a digital good into a plurality of regions;
- a region-statistics calculator configured to:
 - calculate statistics of one or more of the plurality of regions, wherein the statistics of the one or more of the plurality of regions are representative of respective one or more of the plurality of regions,
 - generate the statistics of the one or more of the plurality of regions via a hashing function having a quotient of two weighted, linear, statistical combinations, wherein **weights associated with each region of the one or more of the plurality of regions are correlated with one another within each region;**
- a region quantizer configured to quantize the rational statistics of the one or more of the plurality of regions; and
- a digital-goods marker configured to generate a marked good using the quantized rational statistics.

[0020] Claim 13 currently recites in part that, “weights associated with each region of the one or more of the plurality of regions are correlated with one another within each region.” Nowhere in Venkatesan is there any teaching or suggestion of this feature. Specifically, although Venkatesan describes that “weights are chosen pseudo-randomly” (see Paragraph [0061] of Venkatesan for example), Venkatesan however is silent as to the teaching that “**weights associated with each region of the one or more of the plurality of regions are correlated with one another within each region**” as currently recited in this claim. Having “weights ... correlated with one another within

each region" provides better resilient property against non-noticeable de-synchronization attacks. From a robustness point of view, independent weights may bring fragility against de-synchronization attacks where the attacks may aim at mismatching the independent weights at a watermark detector. (See Paragraphs [0085] and [0086] of the Specification.)

[0021] Consequently, Venkatesan does not teach or suggest all of the elements and features of this claim. Accordingly, Applicant respectfully requests that the rejection of this claim be withdrawn.

Dependent Claims 14, 16 and 17

[0022] Claim 14 is canceled herein without prejudice to or disclaimer of the subject matter recited therein. The rejection of this claim therefore is rendered moot. Claims 16 and 17 ultimately depend from independent claim 13. As discussed above, claim 13 is allowable over the cited documents. Therefore, claims 16 and 17 are also allowable over the cited document of record for at least their dependency from an allowable base claim. These claims may also be allowable for the additional features that each recites.

Independent Claim 18

[0023] Applicant submits that amended independent claim 18 is not obvious in view of Venkatesan. Applicant submits that Venkatesan does not teach or suggest at least the following features of this claim, as amended (with emphasis added):

- obtaining a digital good;
- partitioning the digital good into a plurality of regions;
- calculating rational statistics of one or more regions of the plurality of regions, wherein:

- the rational statistics of the one or more regions are representative of respective one or more regions,
- the rational statistics are semi-global characteristics,
- the rational statistics of the one or more regions are based upon a quotient of two weighted, linear, statistical combinations, and
- the calculating further comprises:
 - **independently generating pseudo-random weights for the one or more regions based at least upon different secret keys, one different secret key for each of the one or more regions, and**
 - **generating weights that are correlated with one another within each of the one or more regions by passing respective pseudo-random weights for each of the one or more regions through an ideal low-pass filter;**
- quantizing the rational statistics;
- marking the digital good with the quantized rational statistics of the plurality of the regions, wherein the marking comprises embedding a watermark via quantization, and wherein **a cutoff frequency of the ideal low-pass filter controls a tradeoff between security and robustness of the watermark, and affects a distortion level of the marked good both in a mean-square-error (MSE) sense and in a perceptual sense.**

[0024] Amended claim 18 currently recites in part, “independently generating pseudo-random weights for the one or more regions based at least upon different secret keys, one different secret key for each of the one or more regions.” Nowhere in Venkatesan is there any teaching or suggestion of this feature. Specifically, Paragraph [0092] of Venkatesan describes that “[a] secret key K is the seed for pseudo-random number generation here. This same K may be used to reconstruct the regions by an exemplary semi-global statistics quantization watermark detecting system 500.” In view of this,

Venkatesan is silent, if not teaches against, as to the claim recitation of “independently generating pseudo-random weights for the one or more regions based at least upon different secret keys, **one different secret key for each of the one or more regions.**”

[0025] Furthermore, claim 18 currently recites in part, “generating weights that are correlated with one another within each of the one or more regions by passing respective pseudo-random weights for each of the one or more regions through an ideal low-pass filter.” Nowhere in Venkatesan is there any teaching or suggestion of this feature. Specifically, although Venkatesan describes that “weights are chosen pseudo-randomly” (see Paragraph [0061] of Venkatesan for example), Venkatesan however is silent as to the teaching that “generating weights that are correlated with one another within each of the one or more regions” as currently recited in this claim. By “generating weights that are correlated with one another within each of the one or more regions,” better resilient property against non-noticeable de-synchronization attacks can be provided. From a robustness point of view, independent weights may bring fragility against de-synchronization attacks where the attacks may aim at mismatching the independent weights at a watermark detector. (See Paragraphs [0085] and [0086] of the Specification.)

[0026] Moreover, Venkatesan is silent as to the teaching of “an ideal low-pass filter”, and hence is silent as to the teaching of “passing respective pseudo-random weights for each of the one or more regions through an ideal low-pass filter” as currently recited in this claim.

[0027] Moreover, amended claim 18 further recites in part that, “a cutoff frequency of the ideal low-pass filter controls a tradeoff between security and robustness of the

watermark, and affects a distortion level of the marked good both in a mean-square-error (MSE) sense and in a perceptual sense.” As discussed above, Venkatesan is silent as to the teaching of “an ideal low-pass filter.” Therefore, it is not surprising that Venkatesan is silent as to the teaching that “a cutoff frequency of the ideal low-pass filter controls a tradeoff between security and robustness of the watermark, and affects a distortion level of the marked good both in a mean-square-error (MSE) sense and in a perceptual sense” as currently recited in this claim.

[0028] Consequently, Venkatesan does not teach or suggest all of the elements and features of this claim. Accordingly, Applicant respectfully requests that the rejection of this claim be withdrawn.

New Claims 19-25

New claims 19-25 are currently added herein. These claims ultimately depend on respective independent claims 1 and 13. As discussed above, independent claims 1 and 13 are allowable over the cited document. Therefore, claims 19-25 are also allowable over the cited document of record for at least their dependency from respective allowable base claims. These claims may also be allowable for the additional features that each recites.

Conclusion

[0029] For at least the foregoing reasons, all pending claims are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the application.

[0030] If any issues remain that would prevent allowance of this application, Applicant requests that the Examiner contact the undersigned representative before issuing a subsequent Action.

Respectfully Submitted,

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